Q Fever (Query Fever)
Table of Contents

Q Fever

Overview [1,2]

For a complete description of Q Fever, refer to the following texts:

- Control of Communicable Diseases Manual (CCDM).
- Red Book, Report of the Committee on Infectious Diseases.

NOTE: Q Fever is a potential bioterrorism weapon. All cases of Q Fever reported in Missouri to date have been from naturally occurring cases. **If the case has no remarkable travel history and is not employed in an occupation that is prone to exposure (working with livestock or other animals), a bioterrorism event should be considered.** If you suspect that you are dealing with a bioterrorism situation, contact your Regional Communicable Disease Coordinator immediately.

Case Definition [3]

Clinical description

Acute infection: A febrile illness usually accompanied by rigors, myalgia, malaise, and retrobulbar headache. Severe disease can include acute hepatitis, pneumonia, and meningoencephalitis. Clinical laboratory findings may include elevated liver enzyme levels and abnormal chest film findings. Asymptomatic infections may also occur.

Chronic infection: Potentially fatal endocarditis may evolve months to years after acute infection, particularly in persons with underlying valvular disease. A chronic fatigue-like syndrome has been reported in some Q fever patients.

Laboratory criteria for diagnosis

- Fourfold or greater change in antibody titer to *C. burnetii* phase II or phase I antigen in paired serum specimens ideally taken 3-6 weeks apart, or,
- Isolation of *C. burnetii* from a clinical specimen by culture, or
- Demonstration of *C. burnetti* in a clinical specimen by detection of antigen or nucleic acid.

Case classification

Confirmed: a clinically compatible or epidemiologically linked case that is laboratory confirmed

Probable: a clinically compatible or epidemiologically linked case with a single supportive Immunoglobulin G (IgG) or Immunoglobulin M (IgM) titer. Individual laboratories determine cutoff titers. CDC tests for IgG antibodies with an indirect immunofluorescence assay (IFA), and uses a titer of 1:128 as the cutoff for significant antibody.

Information Needed for Investigation

Verify the diagnosis. What laboratory tests were conducted and what were the results?
Establish the extent of illness. Determine if household or other close contacts are, or have been, ill by contacting the health care provider, patient or family members.
Contact the Regional Communicable Disease Coordinator, if an outbreak is suspected.
Contact the Bureau of Child Care, if cases are associated with a child care facility.

Case/Contact Follow Up and Control Measures

Try to determine the source of the infection:

- Identify possible exposure to livestock or other animals, especially those that have recently delivered offspring or had spontaneous abortions. Infected livestock may be asymptomatic.
- Identify possible exposure to facilities where livestock are kept or processed, such as feedlots, slaughterhouses etc. Bear in mind that the major mode of transmission is airborne spread of dust and other particles that have become contaminated with the organism. Airborne spread of over one-half mile from the source has been documented.(4)
- Identify possible exposure to potentially contaminated livestock products, such as raw milk, wool, hides, etc. Also, consider such indirect exposure as laundering clothes that may have been contaminated with birth tissues or fluids.

Try to identify other cases within the household or in the immediate geographic area.
Although most cases resolve spontaneously, antibiotics are often recommended due to the risk of serious sequelae. Persons with suspected Q fever should be encouraged to consult a physician.

Control Measures

See the Control of Communicable Diseases Manual, Q Fever, "Methods of control." Q Fever is not normally transmitted person to person; therefore, isolation or quarantine is not necessary.

See the Red Book, Q Fever, "Control Measures."

Laboratory Procedures

Specimens:

Serum: The serologic tests (IgG and IgM) are available from major commercial laboratories and generally require a minimum of 1-2 ml of serum. The State Public Health Laboratory (SPHL) does not test for *C. burnetii*, but can submit specimens to CDC for testing. CDC performs indirect immunofluorescence serology. Additional

information on laboratory procedures can be obtained from the Regional Communicable Disease Coordinator or from staff at the SPHL. The SPHL telephone number is 573-751-0633 and the web site is: http://www.dhss.state.mo.us/Lab/index.htm. (8 May 2003)

Reporting Requirements

Q fever is a Category I(B) disease and shall be reported to the local health authority or to the Missouri Department of Health and Senior Services (DHSS) within 24 hours of first knowledge or suspicion by telephone, facsimile or other rapid communication.

1. For all reported cases complete a "Disease Case Report" (CD-1).
2. For confirmed and probable cases, complete a "Q Fever Case Report" (CDC 55.1).
3. Entry of the complete CD-1 into MOHSIS negates the need for the paper CD-1 to be forwarded to the Regional Health Office.
4. Send the completed secondary investigation form to the Regional Health Office.
5. All outbreaks or "suspected" outbreaks must be reported as soon as possible (by phone, fax or e-mail) to the Regional Communicable Disease Coordinator. This can be accomplished by completing the Missouri Outbreak Surveillance Report (CD-51).
6. Within 90 days from the conclusion of an outbreak, submit the final outbreak report to the Regional Communicable Disease Coordinator.

References

1. Chin, James, ed. "Q Fever." Control of Communicable Diseases Manual, 17th ed. Washington, D.C.: American Public Health Association, 2000: 407-411.
2. American Academy of Pediatrics. "Q Fever". In: Pickering KL, ed. 2000 Red Book: Report of the Committee on Infectious Diseases. 25th ed. Elk Grove Village, IL. 2000: 473-475.
3. Centers for Disease Control and Prevention. Case Definitions for Infectious Conditions Under Public Health Surveillance. MMWR 1997; 46 (No. RR-10). Q Fever," 1999, http://www.cdc.gov/epo/dphsi/casedef/q_fever_current.htm. (8 May 2003)
4. Canadian Centre for Occupational Health and Safety. Biological Hazards, Diseases, Disorders and Injuries: "Q Fever". http://www.ccohs.ca/oshanswers/diseases/qfever.html (8 May 2003)

Other Sources of Information

1. Fiset, Paul and T. E. Woodward. Q Fever. Bacterial Infections of Humans Epidemiology and Control, 3rd ed. Eds. Alfred S. Evans and Philip S. Brachman. New York: Plenum, 1998583-595.
2. Marrie, Thomas J., "*Coxiella burnetti* (Q Fever)". Mandell , Gerald L., John E. Bennett, & Raphael Dolin, Eds. Principles and Practice of Infectious Diseases. 5th ed.: New York: Churchill Livingstone, Inc., 2000: 2043-2050.

3. USAMRIID's Medical Management of Biological Casualties Handbook http://www.vnh.org/BIOCASU/10.html " (8 May 2003)
4. National Library of Medicine, Medline Plus. "Q Fever http://www.nlm.nih.gov/medlineplus/ency/article/001337.htm (8 May 2003)
5. Nochimson, Geofrey, "Q Fever". eMedicine Journal, January 21 2002, V. 3, No 1 (5/01/2002) http://www.emedicine.com/emerg/topic492.htm. (8 May 2003)
6. Edlow, Jonathan A., "Q Fever". eMedicine Journal, January 22 2002, V. 3, No 1 http://www.emedicine.com/EMERG/topic589.htm (8 May 2003)
7. New York City Department of Health, "Medical Treatment and Response to Suspected Q Fever: Information for Health Care Providers During Biologic Emergencies." http://www.nyc.gov/html/doh/html/cd/qfmd.html (8 May 2003)
8. The Merck Veterinary Manual. 8th Ed. Ed. Susan E. Aiello. Whitehouse Station, NJ: Merck & Co., Inc., 1998: 486, 2166. http://www.merckvetmanual.com/mvm/index.jsp (search "q fever"). (8 May 2003)

Q Fever (Query Fever)

FACT SHEET

What is Q Fever?

Q Fever is a disease caused by *Coxiella burnetii*, a rickettsiae. The disease has been reported from all parts of the world and because of the mildness of many cases, more cases occur than are reported. It is spread from infected animals to humans. Each year, a few cases are reported in Missouri.

What are the symptoms in people?

People infected with Q fever usually either have no symptoms or have an illness mistaken for an acute viral infection like influenza. Symptoms may include a sudden onset of fever, chills, headache, weakness, malaise (a general sick feeling), abnormal liver function tests, and severe sweating. In most cases, the illness is of short duration, lasting less than two weeks, even without treatment. Rare complications include liver, heart or lung infections. Complications are more likely to occur among people who have weakened immune systems.

What animals carry the Q fever organism?

C. burnetii may be found in sheep, cattle, goats, cats, dogs, some wild animals (including many wild rodents), birds, and ticks. Animals shed the organism in their urine, feces, milk, and especially in their birth products. Q fever is of special concern with pregnant animals, especially around the time they give birth or abort because of the disease. In pregnant animals, the Q fever organism builds up to enormous numbers in certain tissues and fluids, including the uterus or womb, placenta, udder, birth fluids, and milk.

After giving birth, animals usually eat their placenta and other tissues associated with the birth process. Q fever organisms survive digestion, pass through the animal's intestinal tract, and become discharged with the manure. This allows Q fever to spread widely throughout the environment. Studies show that one gram of placenta from an infected sheep can contain over one billion Q fever organisms.

How is Q Fever spread?

The organisms are inhaled along with dust from premises contaminated by placental tissues, birth fluids, and excreta of infected animals. Direct contact with infected animals and other contaminated materials, such as wool, straw, fertilizer, and laundry of infected people has been associated with spread of the disease. Raw milk from infected cows contains organisms and may be responsible for some cases, but this has not been well documented. Direct transmission from blood or bone marrow transfusion has also been reported. Studies show that contact with just one organism may be enough to cause disease.

Who gets Q fever?

Q fever is a relatively rare disease in people, but anyone can get Q fever if they are exposed to the organism. People at highest risk for Q fever are those who work with infected animals, including veterinarians, lab workers, meat workers, sheep workers, and farmers. The infection occurs worldwide.

How soon after an exposure do symptoms appear?

This is variable, but two to three weeks after exposure is the most common.

How is Q fever diagnosed?
Blood tests can be used to diagnose Q fever.

What is the treatment for Q fever?
Most people infected with Q fever will recover without any treatment. Those who become more seriously ill may receive an antibiotic like tetracycline or chloramphenicol at the discretion of their physician.

How can Q Fever be prevented?
Prevention is through education of the public on sources of infection and the need for proper disinfection and disposal of animal products after the birthing process. Those operating cow and sheep sheds, barns, and laboratories that use such animals should restrict access to these areas. Only pasteurized milk from cows, goats, and sheep should be consumed.
There is a vaccine available in Australia that provides protection against naturally occurring disease. However, it has significant, localized side effects and is not generally available in the United States.

Do infected people need to be excluded from work or school?
Q Fever is not transmitted from person to person; therefore, isolation or exclusion from work or school is not necessary.

How can I disinfect items or surfaces that may be contaminated with Q fever organisms?
The organism can be killed with a 1:10 dilution of chlorine bleach containing 5.25% hypochlorite (regular household bleach), 5% hydrogen peroxide, or 70% ethyl alcohol.

Why is Q fever considered a potential bioterrorism weapon?
While Q fever is not usually fatal, it can be debilitating. The very small numbers of organisms needed to cause infection, coupled with the organism's ability to spread via airborne transmission, make it a potentially useful bioterrorism weapon.

Where can I find more information about Q fever?
CDC Fact Sheet
http://www.cdc.gov/ncidod/dvrd/qfever/index.htm (8 May 2003)
Textbook of Military Medicine: Medical Aspects of Chemical and Biological Warfare
http://www.vnh.org/MedAspChemBioWar/chapters/chapter_26.htm (8 May 2003)
Q FEVER - Medical Management
http://www.hs.state.az.us/phs/edc/edrp/es/qfeverm.htm (8 May 2003)
Clinical Resources by Topic: Infectious Diseases Q Fever Clinical Resources
http://cchs-dl.slis.ua.edu/clinical/infectious/byorganism/rickettsial/qfever.htm (8 May 2003)
Medicinenet.com/focusonasthma
http://www.focusonasthma.com/script/main/art.asp?articlekey=5156&rd=1 (8 May 2003)

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